AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-54 (Cancelled).

55. (Original) An apparatus for producing electromagnetic radiation, the apparatus comprising:

a) an electrically insulated flow generator configured to generate a flow of liquid along an inside surface of an envelope; and

b) first and second electrodes configured to generate an electrical arc within the envelope to produce the electromagnetic radiation.

56. (Original) The apparatus of claim **55** further comprising electrical insulation surrounding said flow generator.

57. (Original) The apparatus of claim **56** wherein said flow generator comprises a conductor.

58. (Original) The apparatus of claim **56** wherein said first electrode comprises a cathode, and wherein said electrical insulation surrounds said cathode and an electrical connection thereto.

59. (Original) The apparatus of claim **58** further comprising said electrical connection, and wherein said electrical connection comprises said flow generator.

60. (Original) The apparatus of claim **56** wherein said electrical insulation surrounding said flow generator comprises said envelope.

61. (Original) The apparatus of claim **60** wherein said electrical insulation surrounding said flow generator further comprises an insulative housing.

62. (Original) The apparatus of claim **61** wherein said insulative housing surrounds at least a portion of said envelope.

63. (Original) The apparatus of claim **62** wherein said electrical insulation further comprises gas in a space between said insulative housing and said portion of said envelope.

64. (Original) The apparatus of claim **63** further comprising a pair of spaced apart seals cooperating with an inner surface of said insulative housing and an outer surface of said portion of said envelope to seal said gas in said space.

65. (Original) The apparatus of claim **64** wherein said gas is compressed.

66. (Original) The apparatus of claim **60** wherein said envelope comprises a transparent cylindrical tube.

67. (Original) The apparatus of claim **66** wherein said tube has a thickness of at least four millimeters.

68. (Original) The apparatus of claim **67** wherein said tube has a thickness of at least five millimeters.

69. (Original) The apparatus of claim **66** wherein said tube comprises a precision bore cylindrical tube.

70. (Original) The apparatus of claim **69** wherein said precision bore cylindrical tube has a dimensional tolerance at least as low as 5×10^{-2} millimeters.

71. (Original) The apparatus of claim **66** wherein said tube comprises quartz.

72. (Original) The apparatus of claim **71** wherein said tube comprises pure quartz.

73. (Original) The apparatus of claim **71** wherein said tube comprises cerium-doped quartz.

74. (Original) The apparatus of claim **66** wherein said tube comprises sapphire.

75. (Original) The apparatus of claim **61** wherein said insulative housing comprises at least one of a plastic and a ceramic.

76. (Withdrawn) The apparatus of claim **55** wherein said first and second electrodes comprise a cathode and an anode, said cathode having a shorter length than said anode.

77. (Withdrawn) The apparatus of claim **55** wherein said first electrode comprises a cathode having a protrusion length along which it protrudes axially inwardly within the envelope toward a center of the apparatus beyond a next-most-inner component of the apparatus within the envelope.

78. (Withdrawn) The apparatus of claim **77** wherein said protrusion length is less than double a diameter of said cathode.

79. (Withdrawn) The apparatus of claim **78** wherein said protrusion length is sufficiently long to prevent said electrical arc from occurring between said flow generator and said second electrode.

80. (Withdrawn) The apparatus of claim **79** wherein said protrusion length is at least three and a half centimeters.

81. (Withdrawn) The apparatus of claim **77** wherein the flow generator comprises the next-most-inner component, and wherein the protrusion length of the cathode beyond the flow generator is less than five centimeters.

82. (Withdrawn) The apparatus of claim **77** further comprising electrical insulation surrounding said flow generator, wherein said insulation surrounds said cathode and an electrical connection thereto.

83. (Withdrawn) A system comprising a plurality of apparatuses as defined by claim **55**, configured to irradiate a common target.

84. (Withdrawn) The system of claim **83** wherein said plurality of apparatuses are configured to irradiate a semiconductor wafer.

85. (Withdrawn) The system of claim **83** wherein said plurality of apparatuses are configured parallel to each other.

86. (Withdrawn) The system of claim **85** wherein each one of said plurality of apparatuses is aligned in a direction opposite to an adjacent one of said plurality of apparatuses.

87. (Withdrawn) The system of claim **86** wherein a cathode of said each one of said plurality of apparatuses is adjacent an anode of said adjacent one of said plurality of apparatuses.

88. (Withdrawn) The system of claim **85** wherein an axial line between said first and second electrodes of each one of said plurality of apparatuses is spaced apart less than $\mathbf{1 \times 10^{-1}}$ meters from an axial line between said first and second electrodes of an adjacent one of said plurality of apparatuses.

89. (Withdrawn) The system of claim **83** further comprising a single circulation device configured to supply liquid to said flow generator of each of said plurality of apparatuses.

90. (Withdrawn) The system of claim **89** wherein said single circulation device is configured to receive liquid from an exhaust port of each of said plurality of apparatuses.

91. (Withdrawn) The system of claim **90** wherein said single circulation device is configured to receive gas from said exhaust port of said each

of said plurality of apparatuses, and wherein said single circulation device comprises a separator configured to separate said liquid from said gas.

92. (Withdrawn) The system of claim **90** wherein said single circulation device comprises a filter for removing particulate contamination from said liquid.

93. (Withdrawn) The system of claim **89** wherein said single circulation device is configured to supply to said flow generator, as said liquid, water having a conductivity of less than about **1** x 10^{-5} Siemens per centimeter.

94. (Withdrawn) The apparatus of claim **55** further comprising a conductive reflector outside said envelope and extending from a vicinity of said first electrode to a vicinity of said second electrode.

95. (Withdrawn) The apparatus of claim **94** wherein said conductive reflector is grounded.

96. (Withdrawn) The apparatus of claim **55** further comprising an exhaust chamber extending outwardly beyond one of said electrodes, configured to accommodate a portion of said flow of liquid.

97. (Withdrawn) The apparatus of claim **96** wherein said exhaust chamber extends axially outwardly sufficiently far beyond said one of said electrodes to isolate said one of said electrodes from turbulence resulting from collapse of said flow of liquid within said exhaust chamber.

98. (Withdrawn) The apparatus of claim **96** wherein said flow generator is configured to generate a flow of gas radially inward from said flow of liquid, and wherein said exhaust chamber extends sufficiently far beyond said one of said electrodes to isolate said one of said electrodes from turbulence resulting from mixture of said flows of liquid and gas.

99. (Withdrawn) The apparatus of claim **96** wherein said electrodes are configured to generate an electrical discharge pulse therebetween to produce an irradiance flash, and wherein said exhaust chamber has a sufficient volume to accommodate a volume of said liquid forced outward by a pressure pulse resulting from said electrical discharge pulse.

100. (Withdrawn) The apparatus of claim **55** further comprising a plurality of power supply circuits in electrical communication with said electrodes.

101. (Withdrawn) The apparatus of claim **100** wherein said plurality of power supply circuits comprises a pulse supply circuit configured to generate an electrical discharge pulse between said first and second electrodes, to produce an irradiance flash.

102. (Withdrawn) The apparatus of claim **101** wherein said plurality of power supply circuits further comprises an idle current circuit configured to generate an idle current between said first and second electrodes.

103. (Withdrawn) The apparatus of claim **102** wherein said plurality of power supply circuits further comprises a starting circuit configured to generate a starting current between said first and second electrodes.

104. (Withdrawn) The apparatus of claim **103** wherein said plurality of power supply circuits further comprises a sustaining circuit configured to generate a sustaining current between said first and second electrodes.

105. (Withdrawn) The apparatus of claim **100** further comprising an isolator configured to isolate at least one of said plurality of power supply circuits from at least one other of said plurality of power supply circuits.

106. (Withdrawn) The apparatus of claim **105** wherein said isolator comprises a mechanical switch.

107. (Withdrawn) The apparatus of claim **105** wherein said isolator comprises a diode.

108. (Withdrawn) The apparatus of claim **55** wherein each of said electrodes comprises a coolant channel for receiving a flow of coolant therethrough.

109. (Withdrawn) The apparatus of claim **108** wherein at least one of said electrodes comprises a tungsten tip having a thickness of at least one centimeter.

110. (Withdrawn) The apparatus of claim **108** wherein said electrodes are configured to generate an electrical discharge pulse to produce an irradiance flash, and further comprising an idle current circuit configured to generate an idle current between said first and second electrodes.

111. (Withdrawn) The apparatus of claim **110** wherein said idle current circuit is configured to generate said idle current for a time period preceding said electrical discharge pulse, said time period being longer than a fluid transit time required by said flow of liquid to travel through said envelope.

112. (Withdrawn) The apparatus of claim **111** wherein said idle current circuit is configured to generate said idle current for at least 3×10^1 milliseconds.

113. (Withdrawn) The apparatus of claim **110** wherein said idle current circuit is configured to generate, as said idle current, a current of at least about 1×10^2 amps.

114. (Withdrawn) The apparatus of claim **110** wherein said idle current circuit is configured to generate, as said idle current, a current of at least about 4×10^2 amps, for at least about 1×10^2 milliseconds.

115. (Original) An apparatus for producing electromagnetic radiation, the apparatus comprising:

a) electrically insulated means for generating a flow of liquid along an inside surface of an envelope; and

b) means for generating an electrical arc within the envelope to produce the electromagnetic radiation.

116. (Original) A method of producing electromagnetic radiation, the method comprising:

a) generating a flow of liquid along an inside surface of an envelope, using an electrically insulated flow generator; and

b) generating an electrical arc between first and second electrodes to produce said irradiance flash.

117. (Withdrawn) A method comprising controlling a plurality of apparatuses as defined by claim **55** to irradiate a common target.

118. (Withdrawn) The method of claim **117** wherein controlling comprises controlling the plurality of apparatuses to irradiate a semiconductor wafer.

119. (Withdrawn) The method of claim **117** wherein controlling comprises causing each one of said plurality of apparatuses to generate said electrical arc in a direction opposite to that of an electrical arc direction in each adjacent one of said plurality of apparatuses.

120. (Withdrawn) The method of claim **116** further comprising accommodating a portion of said flow of liquid in an exhaust chamber extending outwardly beyond one of said electrodes.

121. (Withdrawn) The method of claim **120** wherein accommodating comprises isolating said one of said electrodes from turbulence

resulting from collapse of said flow of liquid within said exhaust chamber.

122. (Withdrawn) The method of claim **120** further comprising generating a flow of gas radially inward from said flow of liquid, and wherein accommodating comprises isolating said one of said electrodes from turbulence resulting from collapse of said flows of liquid and gas.

123. (Withdrawn) The method of claim **120** wherein generating an electrical arc comprises generating an electrical discharge pulse to produce an irradiance flash, and wherein accommodating comprises accommodating a volume of said liquid forced outward by a pressure pulse resulting from said electrical discharge pulse.

124. (Withdrawn) The method of claim **116** further comprising isolating at least one of a plurality of power supply circuits from at least one other of said plurality of power supply circuits.

125. (Withdrawn) The method of claim **116** further comprising cooling said first and second electrodes.

126. (Withdrawn) The method of claim **125** wherein cooling comprises circulating liquid coolant through respective coolant channels of said first and second electrodes.

127. (Withdrawn) The method of claim **125** wherein generating said electrical arc comprises generating an electrical discharge pulse to produce an irradiance flash, and further comprising generating an idle current between said first and second electrodes.

128. (Withdrawn) The method of claim **127** wherein generating said idle current comprises generating said idle current for a time period preceding said electrical discharge pulse, said time period being longer than a fluid transit time required by said flow of liquid to travel through said envelope.

129. (Withdrawn) The method of claim **128** wherein generating comprises generating said idle current for at least **3** x 10^1 milliseconds.

130. (Withdrawn) The method of claim **127** wherein generating comprises generating, as said idle current, a current of at least about **1** x 10^2 amps.

131. (Withdrawn) The method of claim **127** wherein generating comprises generating, as said idle current, a current of at least about **4** x 10^2 amps, for at least about **1** x 10^2 milliseconds.

Claims 132-144 (Cancelled).